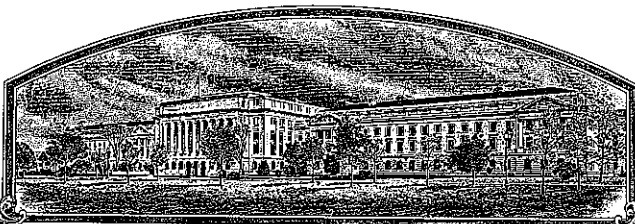


No.

200100033



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Utah State University — Utah Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE REQUIREMENTS OF THE GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Golden Spike'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fourteenth day of June, in the year of our Lord two thousand one.

Attest:

Alan H. Port

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

[Signature]

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICEAPPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following state ments are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Utah State University - Office of Technology Commercialization		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME UT1944-158, UT944158		3. VARIETY NAME Golden Spike	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 1770 North Research Park Way, Suite 120 North Logan UT 84341-1941		5. TELEPHONE (include area code) 435-797-4600		FOR OFFICIAL USE ONLY PVPO NUMBER 20010003 FILING DATE November 29, 2000	
		6. FAX (include area code) 435-797-3376			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Land Grant University		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. David Hole 4820 Old Main Hill Utah State University Logan, UT 84322-4820				FILING AND EXAMINATION FEES: \$ 2705.00 DATE 11/20/00 CERTIFICATION FEE: \$ 320.00 DATE 5/29/01	
11. TELEPHONE (Include area code) 435-797-2235		12. FAX (Include area code) 435-797-3376		13. E_MAIL dhole@mendel.usu.edu	
14. CROP KIND (Common Name) Winter Wheat		15. GENUS AND SPECIES NAME OF CROP <i>Triticum aestivum</i>		16. FAMILY NAME (Botanical)	
17. IS THE VARIETY A FIRST-GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no," go to item 22)	
20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)	
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER 			
NAME (Please print or type) Dr. H. Paul Rasmussen		NAME (Please print or type) M. K. Jeppesen			
CAPACITY OR TITLE Director UAES		DATE 10-31-00		CAPACITY OR TITLE Assoc. Vice President for Research	
				DATE 10/31/00	

Exhibit A - Origin and Breeding History

Golden Spike Winter Wheat

- Summer 1984: Original cross made at Logan, by Dr. Wade G. Dewey.
 Cross number was UT1944
 Parentage = UT1461-185/ID0281
 UT1461-185 was an F₅-derived line from the cross ID114/'Hansel'
 ID114 was an Idaho elite line later released as 'Arbon'.
 Arbon has the pedigree: CItr 14106/Columbia/2/McCall
 ID0281 was an Idaho elite line having the pedigree:
 Hansel/3/CItr 14106/'Columbia'/2/'McCall'
 CItr 14106 is a registered germplasm having resistance to snowmold and dwarf bunt.
- Summer 1985: F₁ plants grown at Logan, Utah. All F₂ seed were bulked.
- Summers 1986, 1987, 1988: F₂ through F₄ generations grown at Logan, UT in modified bulk populations inoculated with common bunt and selected for agronomic and pathological characteristics. Agronomic characteristics selected for included height, resistance to lodging, long tapering head shape, tillering, and resistance to common bunt (mixture of races). Selected seed were bulked for the succeeding generation.
- Summer 1989: F₅ plants grown at Logan, UT in a modified bulk population inoculated with common bunt. Two head were selected from agronomically desirable plants. Selection criteria were the same as noted previously.
- Summer 1990: Seed from individual heads were grown in F_{5:6} head rows at Logan, UT and at the UAES Bluecreek experimental farm (one head from each selected F₅ plant was grown at each location). Selection at Bluecreek was for emergence, uniformity, and dry land seed yield potential. The Logan nursery was inoculated with a mixture of races of dwarf bunt (*Tilletia controversa* Kühn in Rabenh). Individual selected headrow at Bluecreek were evaluated at the Logan nursery for resistance to dwarf bunt. Selected head rows, including UT1944-158, were harvested separately.
- Summer 1991: UT1944-158 was grown in an unreplicated yield test at Logan UT as a F_{5:7} line. Selection was for superior yielding ability as well as resistance to and other agronomic traits.
- Winter 1991: Protein, test weight, sedimentation and subjective kernel evaluations were performed on UT1944-158 to assure adequate breadmaking quality. A sample of UT1944-158 was sent to the USDA-ARS Western Wheat Quality Lab in Pullman, WA for bread quality evaluations including grain protein, flour protein, flour yield, ash, mixing type, and bread loaf volume..

Summer 1992: UT1944-158 was grown in a replicated yield test at the UAES Bluecreek experimental farm. Selection was based on yield, test weight, protein and resistance to dwarf bunt. It was also grown in the Logan dwarf bunt test nursery for further disease resistance evaluation. A sample was also sent to the Western Wheat Quality Lab for continued evaluation.

Summers 1993,
through 2000

UT1944-158 was tested in the county dryland yield tests at six locations throughout Utah each year. It was also tested in the Logan dwarf smut nursery and samples were sent to the Western Wheat Quality Lab for bread and noodle quality evaluations.

Summers 1996,
through 1999

UT1944-158 was tested in the Western Regional Hard Winter Wheat nursery under the designation UT944158.

Summer 1995:

250 Individual heads of uniform UT1944-158 $F_{5:11}$ plants were harvested.

Fall 1995

Individual heads of UT1944-158 were planted in a breeder seed nursery

Summer 1996:

Breeder seed was harvested and bulked from about 200 uniform headrows.

Fall 1997:

UT1944-158 was planted in a foundation field from breeder seed.

Fall 1998:

UT1944-158 was planted in a foundation field from previous foundation seed.

Fall 1999

UT1944-158 is released and named Golden Spike by the Utah Agricultural Experiment Station. Golden Spike is planted in Registered Seed fields.

Golden Spike is an inbred line and has been observed to be uniform and stable for plant and seed characteristics for the previous six generations. Golden Spike contains up to 0.05% red kernels.

Exhibit B - Novelty Statement**Golden Spike Winter Wheat**

To our knowledge, Golden Spike is unlike any other hard white winter cultivar that we have observed. Golden Spike is most similar to Hansel. However Hansel is a hard red winter wheat while Golden Spike is hard white. The hard white winter wheat cultivar that Golden Spike is most similar to is NuWest. However, Golden spike is resistant to dwarf bunt and Nuwest is not. At maturity, NuWest has white glumes while Golden Spike has brown glumes.

Golden Spike chaff color is closest to 10YR/7/6 (Munsell hue/value/chroma), while NuWest is closest to 2.5Y/8/4.

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) Utah State University - OTC	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or RD No., City, State, and Zip Code) 4820 Old Main Hill Utah State University Logan, UT 84322-4820	PVPO NUMBER 200100033
	VARIETY NAME Golden Spike
	TEMPORARY OR EXPERIMENTAL DESIGNATION UT1944-158, UT944158

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____
Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

1=Common 2=Durum 3=Club 4=Other (SPECIFY): _____

2. VERNALIZATION:

1=Spring 2=Winter 3=Other (SPECIFY): _____

3. COLEOPTILE ANTHOCYANIN:

1=Absent 2=Present

4. JUVENILE PLANT GROWTH:

1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):

1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):

1 = Erect 2 = Recurved 1 = Not Twisted 2 = Twisted

7. EAR EMERGENCE:

Number of Days Earlier Than _____ Boundary *

Number of Days Later Than _____ Weston, Promontory *

8. ANTER COLOR:

1 = Yellow

2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

cm Taller Than Boundarycm Shorter Than Weston

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

1 = Absent

2 = Present

B. WAXY BLOOM

1 = Absent

2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent

2 = Present

along margins only.

D. INTERNODE (SPECIFY NUMBER)

1 = Hollow

2 = Semi-solid

3 = Solid

E. PEDUNCLE Hairs

1 = Absent

2 = Present

cm Length

0.1 - 0.5 mm along margins.

11. HEAD (at Maturity):

A. DENSITY

1 = Lax

2 = Middense

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (SPECIFY):

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES (at Maturity):

A. COLOR

1 = White

2 = Tan

3 = Other (SPECIFY): Brown (10YR/7/6 Munsell)

C. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

D. LENGTH

1 = Short

2 = Medium

(ca. 7mm)

(ca. 8mm)

3 = Long (ca. 9mm)

Primarily square. Variation within spikes includes wanting, oblique, rounded.

12. GLUMES (at Maturity) Continued:

200100033

E. WIDTH

☐ 2 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm)
3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

☐ 3 1 = Ovate 2 = Oval 3 = Elliptical

C. BRUSH

☐ 2 1 = Short 2 = Medium 3 = Long
☐ 1 1 = Not Collared 2 = Collared

B. CHEEK

☐ 1 1 = Rounded 2 = Angular

D. CREASE

☐ 2 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

☐ 2 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

☐ 1 1 = White 2 = Amber 3 = Red
4 = OTHER (Specify)

G. PHENOL REACTION (see instructions):

☐ 2 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

☐ 1 1 = Hard 2 = Soft

Ends of seeds are light brown.

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

☐ 0 Stem Rust (*Puccinia graminis* f. sp. *tritici*)

☐ 0 Leaf Rust (*Puccinia recondita* f. sp. *tritici*)

☐ 1 Stripe Rust (*Puccinia striiformis*)

☐ 0 Loose Smut (*Ustilago tritici*)

☐ 0 Tan Spot (*Pyrenophora tritici-repentis*)

☐ 0 Flag Smut (*Urocystis agropyri*)

☐ 0 Halo Spot (*Selenophoma donacis*)

☐ 2 Common Bunt (*Tilletia tritici* or *T. laevis*)

☐ 0 *Septoria nodorum* (Glume Blotch)

☐ 2 Dwarf Bunt (*Tilletia controversa*)

☐ 0 *Septoria avenae* (Speckled Leaf Disease)

☐ 0 Karnal Bunt (*Tilletia indica*)

☐ 0 *Septoria tritici* (Speckled Leaf Blotch)

☐ 0 Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)

☐ 0 Scab (*Fusarium* spp.)

☐ 3 "Snow Molds"

14. Disease (Continued) (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

<input type="checkbox"/> "Black Point" (Kernel Smudge)	<input type="checkbox"/> Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.)
<input type="checkbox"/> Barley Yellow Dwarf Virus (BYDV)	<input type="checkbox"/> Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>)
<input type="checkbox"/> Soilborne Mosaic Virus (SBMV)	<input type="checkbox"/> Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>)
<input type="checkbox"/> Wheat Yellow (Spindle Streak) Mosaic Virus	<input type="checkbox"/> Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>)
<input type="checkbox"/> Wheat Streak Mosaic Virus (WSMV)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Other (SPECIFY)	<input type="checkbox"/> Other (SPECIFY)

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

<input type="checkbox"/> Hessian Fly (<i>Mayetiola destructor</i>)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Stem Sawfly (<i>Cephus</i> spp.)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Cereal Leaf Beetle (<i>Oulema melanopa</i>)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Russian Aphid (<i>Diuraphis noxia</i>)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Greenbug (<i>Schizaphis graminum</i>)	<input type="checkbox"/> Other (SPECIFY)
<input type="checkbox"/> Aphids	<input type="checkbox"/> Other (SPECIFY)

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

Exhibit D – Additional Description of Variety

Golden Spike Winter Wheat

Included as additional description of Golden Spike wheat is milling and baking quality data analyzed by the USDA-ARS Western Wheat Quality Lab, Pullman WA. Milling and baking parameters analyzed include Test Weight, Wheat Protein, Single Kernel Hardness, Single Kernel Weight, Single Kernel Weight Standard Deviation, Flour Yield, Flour Ash, Milling Score, Flour Protein, Mixing Absorption, Baking Absorption, Mix Time, Loaf Volume, and Crumb grain. Statistical comparisons are made with check varieties and include data from 15 site years (from 1991-2000). Statistical analyses were performed with the GLM procedure in SAS (SAS Institute, Cary, NC 27513 Version 8) and means were compared with t-test. Pairwise comparison rate was set at $\alpha=0.05$ but individual t-probabilities are given in Table 3.

Methods of analysis of the Western Wheat Quality Lab are available in their annual reports, the most recent of which is:

Morris, C.F. *et al.* Oct. 2000. Fifty-Second Annual Report of the Western Wheat Quality Laboratory, 1999 Crop Vol. 2

Abbreviations and methods are also available at:

<http://www.wsu.edu/~wwql/index4cult.html>

ASSESSMENT OF THE QUALITY OF GOLDEN SPIKE (UT944158)

C. F. Morris & D. A. Engle

USDA-ARS Western Wheat Quality Lab

April 2001

INTRODUCTION

Following is an assessment of the quality of Golden Spike. Assessment of wheat quality involves data interpretation and therefore may vary accordingly. Data are from the Western Wheat Quality Lab (WWQL) Annual Crop Reports and represent standard cultivar development and nursery testing procedures.

Nurseries and the corresponding WWQL Annual Report nursery number are described in Table 1. Due to environmental effects, experimental genotypes are evaluated by comparison to check varieties grown in the same nursery (same location-year) to minimize environmental effects. Check varieties and their occurrence in various nurseries are listed in Table 2. For statistical purposes a limited number of check varieties are used. These are generally selected on the basis of class, current production, occurrence in nurseries, and known quality attributes. Statistical analyses are conducted as essentially paired t-tests using balanced designs. N (the number of paired comparisons) varies according to the test conducted. Table 3 lists the analysis of variance by check variety for each quality parameter. LSDs assume an $\alpha = 0.05$. Table 4 lists the data used for analysis.

INTERPRETIVE SUMMARY FOR GOLDEN SPIKE

(quality as compared to Cache, Bonneville, Fairview, Hansel, Manning, Promontory and Utah-100)

General grain properties of test weight, grain protein and kernel size are similar to or inferior to the checks.

Overall milling performance is similar to the checks. Flour yield is sometimes better than the checks but flour ash is poorer.

Bread baking performance is better than Cache, poorer than Hansel and similar to the other checks..

Suitable data are not available to compare Golden Spike's performance for noodle making application. On an absolute basis, it has good color reaction in alkaline noodle testing and appears to be of non-waxy starch composition. Golden Spike has potential as a dual purpose wheat for noodle and bread uses.

Table 1: Nursery sources for Golden Spike data set				
YEAR	NURSCO	nurname	location	bredname
91	78	PRELIMINARY HRW DRYLAND	BLUECREEK	D. HOLE
92	87	UTAH DRYLAND HRW	BLUECREEK	D. HOLE
93	98	PRELIMINARY HRW DRYLAND	BLUECREEK	D. HOLE
94	81	PRELIMINARY DRYLAND HRW	BLUECREEK	D. HOLE
94	113	W. REGIONAL HARD RED & WHITE WINTER		
95	94	USU DRYLAND WINTER WHEAT	BLUECREEK	D. HOLE
96	106	PRELIMINARY DRYLAND	BLUECREEK	D. HOLE
96	115	WESTERN REG. HARD WINTER 1 YEAR QUAD	VARIOUS	
97	176	WESTERN REGIONAL HARD WINTER		
97	1087	PRELIMINARY DRYLAND	BLUECREEK	D. HOLE
98	171	HARD WINTER QUALITY	BLUECREEK	D. HOLE
98	173	WESTERN REGIONAL HARD WINTER	VARIOUS	
99	5	WESTERN REGIONAL HARD WINTER	COMPOSITE	
99	146	PRELIMINARY DRYLAND	BLUECREEK	D. HOLE
2000	97	PRELIMINARY DRYLAND	BLUECREEK	D. HOLE

Table 2: Nurseries grouped with Golden Spike			
Obs	VAR	NURSCO	COUNT
1	BLIZZARD	81	1
2	BLIZZARD	94	1
3	BLIZZARD	98	1
4	BLIZZARD	106	1
5	BONNEVILLE	81	1
6	BONNEVILLE	94	1
7	BONNEVILLE	97	1
8	BONNEVILLE	106	1
9	BONNEVILLE	146	1
10	BONNEVILLE	171	1
11	BONNEVILLE	1087	1
12	CACHE	81	1
13	CACHE	87	1
14	CACHE	94	1
15	CACHE	97	1
16	CACHE	98	1
17	CACHE	106	1
18	CACHE	146	1
19	CACHE	171	1
20	CACHE	1087	1
21	FAIRVIEW	97	1
22	FAIRVIEW	106	1
23	FAIRVIEW	146	1
24	FAIRVIEW	171	1
25	FAIRVIEW	1087	1
26	FINLEY	113	1
27	FINLEY	173	1
28	FINLEY	176	1
29	GOLDEN SPIKE	5	1
30	GOLDEN SPIKE	78	1
31	GOLDEN SPIKE	81	1
32	GOLDEN SPIKE	87	1
33	GOLDEN SPIKE	94	1
34	GOLDEN SPIKE	97	1
35	GOLDEN SPIKE	98	1
36	GOLDEN SPIKE	106	1
37	GOLDEN SPIKE	113	1
38	GOLDEN SPIKE	115	1
39	GOLDEN SPIKE	146	1
40	GOLDEN SPIKE	171	1
41	GOLDEN SPIKE	173	1
42	GOLDEN SPIKE	176	1
43	GOLDEN SPIKE	1087	1
44	HANSEL	81	1
45	HANSEL	87	1
46	HANSEL	94	1
47	HANSEL	97	1
48	HANSEL	98	1
49	HANSEL	106	1

Table 2: Nurseries grouped with Golden Spike			
Obs	VAR	NURSCO	COUNT
50	HANSEL	146	1
51	HANSEL	171	1
52	HANSEL	1087	1
53	MANNING	78	1
54	MANNING	81	1
55	MANNING	87	1
56	MANNING	94	1
57	MANNING	98	1
58	MANNING	106	1
59	PROMONTORY	78	1
60	PROMONTORY	81	1
61	PROMONTORY	87	1
62	PROMONTORY	94	1
63	PROMONTORY	97	1
64	PROMONTORY	98	1
65	PROMONTORY	106	1
66	PROMONTORY	146	1
67	PROMONTORY	171	1
68	PROMONTORY	1087	1
69	SURVIVOR	98	1
70	UTAH-100	97	1
71	UTAH-100	106	1
72	UTAH-100	146	1
73	UTAH-100	171	1
74	UTAH-100	1087	1
75	WANSER	5	1
76	WANSER	113	1
77	WANSER	115	1
78	WANSER	173	1
79	WANSER	176	1
80	WESTON	81	1
81	WESTON	94	1
82	WESTON	97	1
83	WESTON	98	1
84	WESTON	106	1
85	WESTON	146	1
86	WESTON	171	1
87	WESTON	1087	1

Table 3. PROC GLM SAS Output gleanings. Balanced pair t-Test design.														
Obs	var	test	pvalue	lsd	var_h	mean_h	var_l	mean_l	DIFF	group_h	n_h	group_l	n_l	BALANCED
1 VS	TWT		0.04	1.16	CACHE	61.68	GOLDEN	60.46	SIGNIFICANT	A	9	B	9	YES
2 VS	TWT		0.01	1.47	BONNEVILLE	62.63	GOLDEN	60.09	SIGNIFICANT	A	7	B	7	YES
3 VS	TWT		0.17	1.33	FAIRVIEW	60.76	GOLDEN	59.96	NON	A	5	A	5	YES
4 VS	TWT		0.09	1.15	HANSEL	61.41	GOLDEN	60.46	NON	A	9	A	9	YES
5 VS	TWT		0.07	1.75	MANNING	61.62	GOLDEN	60.07	NON	A	6	A	6	YES
6 VS	TWT		0.00	1.09	PROMONTORY	62.90	GOLDEN	60.26	SIGNIFICANT	A	10	B	10	YES
7 VS	TWT		0.35	1.88	GOLDEN	59.96	UTAH-100	59.24	NON	A	5	A	5	YES
8 VS	WPROT		0.00	0.73	CACHE	14.43	GOLDEN	12.84	SIGNIFICANT	A	9	B	9	YES
9 VS	WPROT		0.00	0.66	BONNEVILLE	14.03	GOLDEN	12.63	SIGNIFICANT	A	7	B	7	YES
10 VS	WPROT		0.28	1.08	FAIRVIEW	12.94	GOLDEN	12.46	NON	A	5	A	5	YES
11 VS	WPROT		0.00	0.66	HANSEL	14.10	GOLDEN	12.84	SIGNIFICANT	A	9	B	9	YES
12 VS	WPROT		0.83	0.97	GOLDEN	13.60	MANNING	13.52	NON	A	6	A	6	YES
13 VS	WPROT		0.94	0.59	GOLDEN	13.04	PROMONTORY	13.02	NON	A	10	A	10	YES
14 VS	WPROT		0.08	0.91	UTAH-100	13.24	GOLDEN	12.46	NON	A	5	A	5	YES
15 VS	SKHRD		0.14	6.09	CACHE	72.30	GOLDEN	68.13	NON	A	7	A	7	YES
16 VS	SKHRD		0.99	5.60	GOLDEN	68.13	BONNEVILLE	68.10	NON	A	7	A	7	YES
17 VS	SKHRD		0.22	5.43	FAIRVIEW	69.04	GOLDEN	66.18	NON	A	5	A	5	YES
18 VS	SKHRD		0.04	3.69	HANSEL	71.97	GOLDEN	68.13	SIGNIFICANT	A	7	B	7	YES
19 VS	SKHRD		0.05	7.60	MANNING	81.03	GOLDEN	73.27	SIGNIFICANT	A	3	B	3	YES
20 VS	SKHRD		0.00	1.74	PROMONTORY	72.09	GOLDEN	68.13	SIGNIFICANT	A	7	B	7	YES
21 VS	SKHRD		0.05	8.22	UTAH-100	74.52	GOLDEN	66.18	SIGNIFICANT	A	5	B	5	YES
22 VS	SKWT		0.03	2.40	CACHE	32.21	GOLDEN	29.33	SIGNIFICANT	A	7	B	7	YES
23 VS	SKWT		0.03	3.09	BONNEVILLE	32.99	GOLDEN	29.33	SIGNIFICANT	A	7	B	7	YES
24 VS	SKWT		0.01	1.78	FAIRVIEW	32.70	GOLDEN	29.34	SIGNIFICANT	A	5	B	5	YES
25 VS	SKWT		0.58	2.48	HANSEL	29.93	GOLDEN	29.33	NON	A	7	A	7	YES
26 VS	SKWT		0.14	3.13	MANNING	29.63	GOLDEN	27.90	NON	A	3	A	3	YES
27 VS	SKWT		0.00	1.49	PROMONTORY	32.80	GOLDEN	29.33	SIGNIFICANT	A	7	B	7	YES
28 VS	SKWT		0.25	2.47	UTAH-100	30.54	GOLDEN	29.34	NON	A	5	A	5	YES
29 VS	SKWTS		0.26	1.15	CACHE	8.60	GOLDEN	8.01	NON	A	7	A	7	YES
30 VS	SKWTS		0.92	0.65	GOLDEN	8.01	BONNEVILLE	7.99	NON	A	7	A	7	YES
31 VS	SKWTS		0.31	0.47	FAIRVIEW	8.00	GOLDEN	7.80	NON	A	5	A	5	YES
32 VS	SKWTS		0.25	1.04	GOLDEN	8.01	HANSEL	7.47	NON	A	7	A	7	YES
33 VS	SKWTS		0.04	0.75	GOLDEN	8.30	MANNING	7.50	SIGNIFICANT	A	3	B	3	YES
34 VS	SKWTS		0.29	0.39	PROMONTORY	8.20	GOLDEN	8.01	NON	A	7	A	7	YES
35 VS	SKWTS		0.38	0.67	UTAH-100	8.04	GOLDEN	7.80	NON	A	5	A	5	YES

Table 3. PROC GLM SAS Output gleanings, Balanced pair t-Test design.

Obs	var	test	pvalue	lsd	var_h	mean_h	var_l	mean_l	DIFF	group_h	n_h	group_l	n_l	BALANCED
36 VS	FYELD	FYELD	0.00	1.33	GOLDEN	70.28	CACHE	66.23	SIGNIFICANT	A	9	B	9	YES
37 VS	FYELD	FYELD	0.61	0.90	BONNEVILLE	71.04	GOLDEN	70.84	NON	A	7	A	7	YES
38 VS	FYELD	FYELD	0.59	1.61	GOLDEN	70.20	FAIRVIEW	69.86	NON	A	5	A	5	YES
39 VS	FYELD	FYELD	0.11	0.94	GOLDEN	70.28	HANSEL	69.54	NON	A	9	A	9	YES
40 VS	FYELD	FYELD	0.01	1.59	GOLDEN	70.15	MANNING	67.88	SIGNIFICANT	A	6	B	6	YES
41 VS	FYELD	FYELD	0.50	0.96	GOLDEN	70.16	PROMONTORY	69.86	NON	A	10	A	10	YES
42 VS	FYELD	FYELD	0.01	1.40	GOLDEN	70.20	UTAH-100	67.92	SIGNIFICANT	A	5	B	5	YES
43 VS	FASH	FASH	0.01	0.02	CACHE	0.40	GOLDEN	0.38	SIGNIFICANT	A	9	B	9	YES
44 VS	FASH	FASH	0.06	0.02	GOLDEN	0.39	BONNEVILLE	0.37	NON	A	7	A	7	YES
45 VS	FASH	FASH	0.02	0.03	GOLDEN	0.40	FAIRVIEW	0.36	SIGNIFICANT	A	5	B	5	YES
46 VS	FASH	FASH	0.24	0.01	GOLDEN	0.38	HANSEL	0.37	NON	A	9	A	9	YES
47 VS	FASH	FASH	0.09	0.02	GOLDEN	0.36	MANNING	0.34	NON	A	6	A	6	YES
48 VS	FASH	FASH	0.09	0.02	GOLDEN	0.38	PROMONTORY	0.36	NON	A	10	A	10	YES
49 VS	FASH	FASH	0.02	0.01	GOLDEN	0.40	UTAH-100	0.39	SIGNIFICANT	A	5	B	5	YES
50 VS	MSCOR	MSCOR	0.00	1.49	GOLDEN	85.93	CACHE	80.50	SIGNIFICANT	A	9	B	9	YES
51 VS	MSCOR	MSCOR	0.10	1.59	BONNEVILLE	87.03	GOLDEN	85.77	NON	A	7	A	7	YES
52 VS	MSCOR	MSCOR	0.05	1.66	FAIRVIEW	86.32	GOLDEN	84.70	NON	A	5	A	5	YES
53 VS	MSCOR	MSCOR	0.62	1.57	GOLDEN	85.93	HANSEL	85.58	NON	A	9	A	9	YES
54 VS	MSCOR	MSCOR	0.27	2.72	GOLDEN	86.78	MANNING	85.47	NON	A	6	A	6	YES
55 VS	MSCOR	MSCOR	0.51	1.68	PROMONTORY	86.49	GOLDEN	85.98	NON	A	10	A	10	YES
56 VS	MSCOR	MSCOR	0.05	1.56	GOLDEN	84.70	UTAH-100	83.16	NON	A	5	A	5	YES
57 VS	FPROT	FPROT	0.00	0.69	CACHE	12.94	GOLDEN	11.54	SIGNIFICANT	A	9	B	9	YES
58 VS	FPROT	FPROT	0.00	0.56	BONNEVILLE	12.86	GOLDEN	11.39	SIGNIFICANT	A	7	B	7	YES
59 VS	FPROT	FPROT	0.43	1.00	FAIRVIEW	11.58	GOLDEN	11.26	NON	A	5	A	5	YES
60 VS	FPROT	FPROT	0.00	0.62	HANSEL	12.90	GOLDEN	11.54	SIGNIFICANT	A	9	B	9	YES
61 VS	FPROT	FPROT	0.43	0.65	GOLDEN	12.35	MANNING	12.13	NON	A	6	A	6	YES
62 VS	FPROT	FPROT	0.60	0.37	PROMONTORY	11.87	GOLDEN	11.78	NON	A	10	A	10	YES
63 VS	FPROT	FPROT	0.22	1.00	UTAH-100	11.78	GOLDEN	11.26	NON	A	5	A	5	YES
64 VS	MABS	MABS	0.31	1.35	CACHE	64.50	GOLDEN	63.87	NON	A	9	A	9	YES
65 VS	MABS	MABS	0.04	0.96	BONNEVILLE	64.29	GOLDEN	63.27	SIGNIFICANT	A	7	B	7	YES
66 VS	MABS	MABS	0.96	0.93	FAIRVIEW	63.26	GOLDEN	63.24	NON	A	5	A	5	YES
67 VS	MABS	MABS	0.00	0.73	HANSEL	65.38	GOLDEN	63.87	SIGNIFICANT	A	9	B	9	YES
68 VS	MABS	MABS	0.54	1.30	GOLDEN	64.98	MANNING	64.65	NON	A	6	A	6	YES
69 VS	MABS	MABS	0.61	0.95	GOLDEN	64.20	PROMONTORY	63.98	NON	A	10	A	10	YES
70 VS	MABS	MABS	0.36	1.71	UTAH-100	63.88	GOLDEN	63.24	NON	A	5	A	5	YES

Table 4: Raw Data																					
Obs	YEAR	NURSCO	LABNUM	VAR	TWT	SKHRD	SKWT	SKWTS	WPROT	RVA	FSV	FYELD	MSCOR	FASH	FPROT	MABS	BABS	MTIME	LVOL	BCRGR	124ANC
57	97	176	1760004	FINLEY	63	60.5	39.5	9.9	12.4			66.8	83.9	0.33	11.4	63.1	67.3	2.9	995	2	
58	97	176	1760016	GOLDEN SPIKE	62.4	58.4	36.1	9.4	10.9			66.6	85.2	0.32	9.8	60.9	63.1	4.2	920	4	
59	98	171	1710001	CACHE	61.3	78.6	32.2	9.3	14			67.1	79.5	0.44	12.5	62.6	66.8	1.7	850	7	
60	98	171	1710002	HANSEL	60.6	74.5	29.6	6.1	14.2			66.2	82.2	0.43	12.8	61.6	64.8	5.7	950	2	
61	98	171	1710003	WESTON	63.1	65.5	36.7	7	12.6			66.7	84.8	0.37	11.6	61.5	63.7	2.2	955	2	
62	98	171	1710004	BONNEVILLE	62.9	76.5	31	7.2	13.4			71	85.1	0.41	12	61.8	64	4.2	910	4	
63	98	171	1710006	PROMONTORY	63.9	68.8	35.7	7	11.8			70.2	85.9	0.38	10.3	60.7	62.9	3.9	865	6	
64	98	171	1710007	FAIRVIEW	61.8	74	35.9	6.5	12			69.5	86.7	0.35	10.7	60.6	62.8	4.5	870	6	
65	98	171	1710008	UTAH-100	60	81.3	31.9	7.4	12.4			68.2	82.2	0.41	10.6	60.6	63.8	4.2	945	4	
66	98	171	1710009	GOLDEN SPIKE	61.5	64.8	34.1	6.9	11.1			71.9	85.5	0.42	9.8	60.7	63.9	5.1	830	6	826
67	98	173	1730002	WANSER	62.7	66.2	34.8	8.5	12.8			68.9	82.9	0.41	11.1	64.2	66.4	3.7	990	4	
68	98	173	1730003	FINLEY	63.8	71.8	37.4	9.3	11.7			69.1	84.2	0.39	10.3	63.3	65.5	2.8	1005	4	
69	98	173	1730007	GOLDEN SPIKE	62	70.9	34.2	9.6	11.2	174	20.6	70.5	85.1	0.4	9.7	63.3	65.5	4.7	880	5	82.2
70	99	5	50002	WANSER	63	70.8	32.3	8.4	14.3		19.1	69.4	86.1	0.36	13	65.8	68	3	1025	2	72.1
71	99	5	50003	GOLDEN SPIKE	62.4	69.8	33.4	10.2	12.3	162	20.8	69.6	87.8	0.33	10.9	65.8	68.8	4.6	905	3	81.9
72	99	146	1460001	CACHE	61.1	72.9	31.3	10.4	15.3			66.7	79.1	0.44	13.7	66.6	68.8	1.7	925	5	
73	99	146	1460002	HANSEL	60.9	72.9	30.7	10.8	15.1			68.1	83.7	0.4	13.9	65.6	67.8	4.6	980	3	
74	99	146	1460003	WESTON	62.5	59	34.5	9.4	13.7			68.5	83.6	0.39	12.5	64.5	66.7	2.4	995	2	
75	99	146	1460004	BONNEVILLE	61.8	71.7	30.5	10.6	14.8			70.3	84.9	0.4	13.3	65.6	68.8	4.7	1015	2	
76	99	146	1460006	PROMONTORY	64.3	79.4	30.3	9.3	12.7			71.5	87.2	0.38	11.3	63.3	65.5	4.6	895	5	
77	99	146	1460007	FAIRVIEW	59.6	74.2	30.3	9.4	13.8			70.7	85.3	0.4	12.3	63.1	65.3	5.2	980	2	
78	99	146	1460008	UTAH-100	57.5	77	29.7	10.3	14.4			67.9	81.9	0.41	12.8	63.6	66.3	3.2	1040	2	
79	99	146	1460009	GOLDEN SPIKE	59.5	76.2	28.1	9.3	13.4	157	19.1	65.4	77.2	0.45	11.7	63.5	65.7	4.7	995	3	78.1
80	0	97	970001	CACHE	62.1	66.6	28.5	7.1	14.1			68.8	81.8	0.43	13.4	66.5	68.7	2.2	855	6	
81	0	97	970002	HANSEL	62.3	63.7	27.7	6.1	14.1			68.4	82.4	0.41	12.9	66.1	68.3	2.4	1005	2	
82	0	97	970003	WESTON	62.8	49.9	34.2	9	13.4			69.3	83.9	0.4	13.5	66.7	68.9	4.6	980	4	
83	0	97	970004	BONNEVILLE	62.3	62.5	29.7	7.5	14.5			69.1	84.7	0.38	12.6	65.7	68.9	4.2	925	5	
84	0	97	970006	PROMONTORY	63	67.1	29.2	7.1	13.2			68.4	84.5	0.39	12.8	66.5	68.7	5.7	970	4	
85	0	97	970007	FAIRVIEW	61.1	63.1	28.7	8.2	13.9			66.2	80.6	0.4	12.8	67.7	68.9	3.2	1020	4	
86	0	97	970008	UTAH-100	58.7	66.5	27.7	7.5	13.8			69.2	82.2	0.43	12.1	65.2	68.4	4.7	995	3	
87	0	97	970009	GOLDEN SPIKE	60.6	61.2	25.4	7.6	12.9												

EXHIBIT E STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Utah State University - OTC	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER UT1944-158 UT944158	3. VARIETY NAME Golden Spike
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) 4820 Old Main Hill Logan, UT 84322-4820	5. TELEPHONE (include area code) 435-797-2235	6. FAX (include area code) 435-797-3376
7. PVPO NUMBER		200100033

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO
If no, give name of country

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

The original crosses and selection of Golden Spike (UT1944-158) were made by Dr. Wade Dewey, plant breeder at the Utah Agricultural Experiment Station, at Utah State University, Logan, UT. Following Dr. Dewey's retirement in 1989, Testing and further selection were under the direction of Dr. David Hole, plant breeder at the Utah Agricultural Experiment Station. By agreement between employee and the Utah Agricultural Experiment Station and Utah State University, all rights to any invention, discovery or development made by an employee are assigned to the employer. No rights to such invention, discovery or development are retained by the employee.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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